

Having described the invention, the following is claimed:

1. An apparatus for determining a vehicle occupant characteristic, said apparatus comprising:

means for collecting a first image of an occupant location while the occupant location is subject to a first lighting condition;

means for providing light onto the occupant location;

means for collecting a second image of the occupant location while the occupant location is subject to the first lighting condition and the provided light;

means for generating a third image of the occupant location indicative of the difference between the first and second images; and

means for processing the third image to determine the vehicle occupant characteristic.

2. An apparatus as set forth in claim 1, wherein said means for providing light comprises means for providing light in a pattern.

3. An apparatus as set forth in claim 2, wherein said means for providing light comprises means to provide the pattern such that the pattern light is at least partially distorted when the pattern light impinges upon surfaces at the occupant location, said means for collecting the second image comprises means for collecting the second image to be indicative of the distortion of the pattern light, and said means for processing the third image comprises means for processing the distortion indication to determine the vehicle occupant characteristic.

4. An apparatus as set forth in claim 2, wherein said means for providing light comprises means to provide the pattern such that the pattern light at least partially impinges upon an occupant at the occupant location dependent upon position of the occupant, said means for collecting the second image comprises means for collecting the second image to be indicative of the impingement of the pattern light upon the occupant, and said means for processing the third image comprises means for processing the indication of pattern light impingement upon the occupant to determine the vehicle occupant characteristic.

5. An apparatus as set forth in claim 4, wherein said means for processing comprises means for determining occupant position relative to a vehicle component as the determined vehicle occupant characteristic.

6. An apparatus as set forth in claim 1, wherein said means for collecting a first image and said means for collecting a second image are provided in a single component, said means for processing comprises means for determining distance to an occupant at the occupant location from said single component as the determined vehicle occupant characteristic.

7. An apparatus as set forth in claim 6, wherein said single component is located forward of the occupant location with regard to a vehicle-based orientation.

8. An apparatus as set forth in claim 7, wherein said means for providing light directs light rearward onto the occupant location.

9. An apparatus as set forth in claim 1, wherein said means for collecting a first image, said means for providing light, and said means for collecting a second image are located lateral of the occupant location with regard to a vehicle-based orientation.

10. An apparatus as set forth in claim 9, wherein said means for processing comprises means for determining position of an occupant along a fore-to-aft axis with regard to the vehicle-based orientation as the determined vehicle occupant characteristic.

11. An apparatus as set forth in claim 1, wherein said means for providing light comprises means for providing structured light.

12. An apparatus as set forth in claim 1, wherein the first lighting condition is ambient light within the vehicle.

13. An apparatus as set forth in claim 1, wherein said apparatus is part of an occupant protection system that includes an acutatable occupant protection device, said apparatus further comprising means for outputting a signal indicative of the determined vehicle occupant characteristic as an input utilized to control the occupant protection device.

14. A method for determining a vehicle occupant characteristic, said method comprising:

collecting a first image of an occupant location while the occupant location is subject to a first lighting condition;

providing light onto the occupant location;

collecting a second image of the occupant location while the occupant location is subject to the first lighting condition and the provided light;

generating a third image of the occupant location indicative of the difference between the first and second images; and

processing the third image to determine the vehicle occupant characteristic.

15. A method as set forth in claim 14, wherein said step of processing comprises determining occupant position relative to a vehicle component as the determined vehicle occupant characteristic.

16. A method as set forth in claim 14, wherein said step of providing light comprises providing structured light.